WINCOR NIXDORF

BEETLE

POS Motherboard (**G1-CPU-Desktop-IMP**)

INTEL CORE 2 DUO E6400 (65W)
INTEL CORE 2 DUO E4300 (65W)
INTEL PENTIUM Dual Core E2160 (65W)
INTEL CELERON 440 (35W)

User Manual *(Edition May 2009)*

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Introduction

The G1-CPU-DESKTOP-IMP-945G (01750159916,MB) is the next step in the class of BEETLE-Systems. Benefit is the used new microprocessor family called Core 2 Duo with dual core technology. The two cores share up to 4MB L2 cache and communicate over a fast FSB with the 945G chipset providing enhanced graphics support.

The following leading edge technologies are supported:

Microprocessors

- INTEL CORE 2 DUO E6400 (65W)
- INTEL CORE 2 DUO E4300 (65W)
- INTEL PENTIUM Dual Core E2160 (65W)
- INTEL CELERON 440 (35W)

Chipset

Platform with chipset 945G Express

- Chipset with GMCH and ICH7
- Enhanced internal graphic with new Graphic Engine GMA950
- Use of DDR2 RAM 667 (PC5300), up to 1Gb technology
- Improvement of System Performance by internal Graphics and SATA II Interfaces
- COM 3,4 onboard

Features of the G1-CPU-DESKTOP-IMP-945G in the Beetle System

- Max 8 USB ports (USB1.1 and 2.0)
- PCI Express x1 Interface
- LAN integrated onboard
- Min. Main Memory 256MB; Max Main Memory 4GB*
- Use of existing Standard-PCI Slot cards
- Onboard PCI connector for PCI based Plug-in modules: Secondary TFT Controller, VGA4 Controller
- Jumperless motherboard
- Support of DVD (CD-ROM)
- New SDVO Bridges for Panellink Interface and for DVI Interface
- Risercard with PCI Standard connectors
- Optional Risercard with PCI Express x1 Interface
- CRT-Bridge
- Dual Independend Display functionallity
-
- No support of onboard LPT1
- No support of Gameport
- No support of analog DVD Audio
- No support of WLAN
- No support of Floppydisk
- No support of Line In
- No support of Power USB Adapter

Attention: Only TFT- displays with DDC (like BA72A-2 and BA73A-2) will be supported.

***Only about 3GB of system memory will be max. available, even if 4GB are assembled.**

Mechanical dimensions of G1-CPU-DESKTOP-IMP-945G:

The bracket/ connector outlets of the motherboard are similar to F-series, except COM3* and COM4* are onboard. The formfactor of the bareboard is similar to the D2*- CPU. Therefore the G1-CPU-DESKTOP-IMP-945G is able to support the BEETLE/systems B/MII and B/SII.

Long term availability:

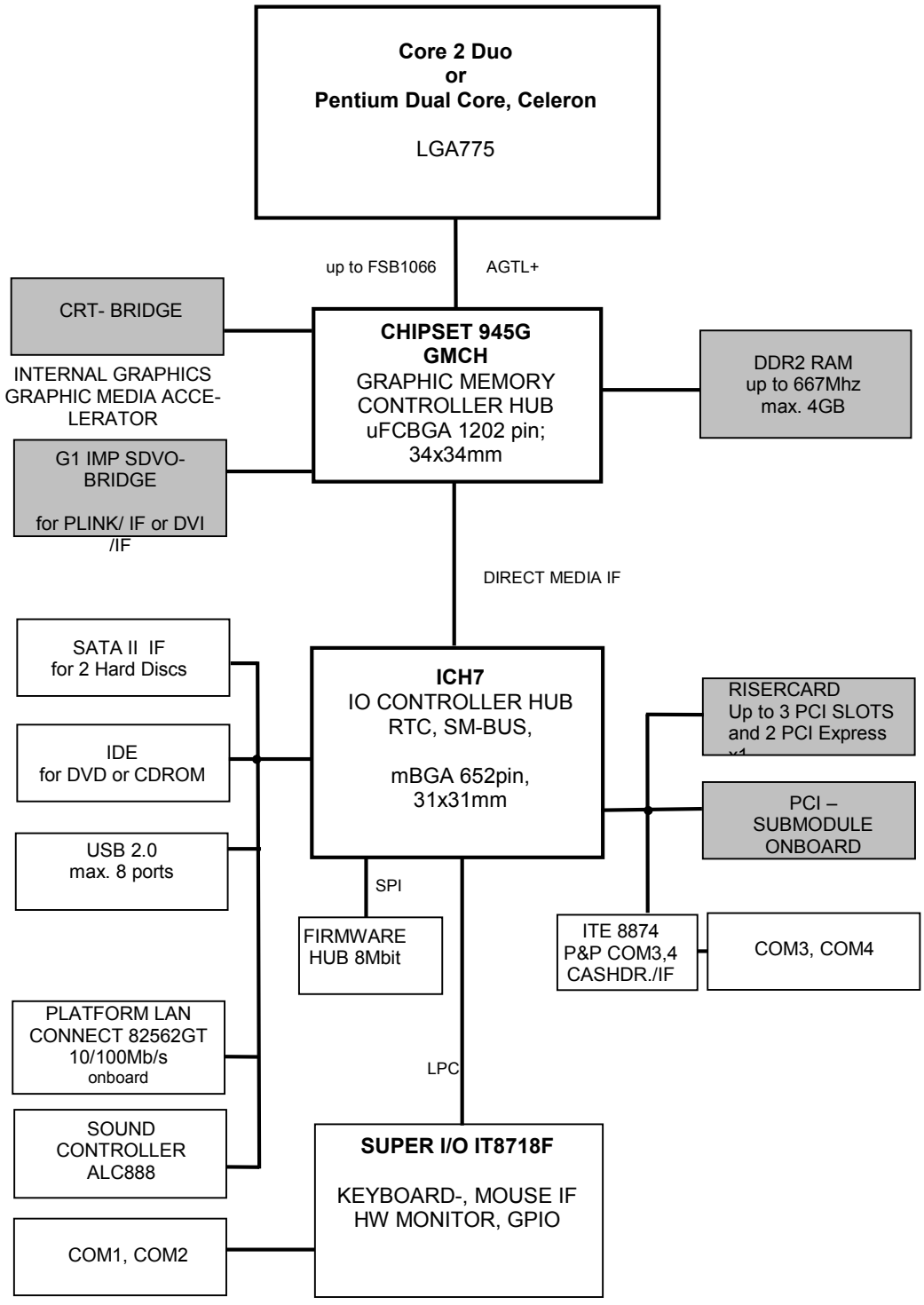
Mentioned CPUs and chipset 945G are supported by the INTEL IPD (Infrastructure Processor Devision) “Embedded” Group. In this way the longtime- availability is guaranteed.

Operating systems/BIOS:

The G1-CPU-DESKTOP-IMP-945G has complete PC functionality and supports the following operating systems: WIN/XP, WIN/XP Embedded and Linux. Features of PnP, ACPI, DMI are implemented. The size of the firmware Hub is 8Mbit.

The BIOS bases on a Phoenix Core and customized POS specific functions are implemented.

Functional **B**locks of **G1-CPU-D**esktop**-IMP-945G**



G1-CPU-DESKTOP-IMP-945G

Technical Data

Supported Systems	BEETLE /MII, BEETLE /S-II, BEETLE/X, BEETLE/iPOS, BEETLE /MII+, BEETLE /S-II+
Architecture	PC-AT compatible and POS-specific functional units
Operating Modes	Normal Mode, Power Save Mode
Power Management	ACPI 1.0, APM 1.2
Operating Systems	WIN XP, WIN XP Embedded, WEPOS, WNLPOS
Microprocessor	INTEL Core 2 Duo E6400 processor (775 Pin LGA775 package, 65 nm technology) 2,133 GHz INTEL Core 2 Duo E4300 processor (775 Pin LGA775 package, 65 nm technology) 1,8 GHz INTEL Pentium Dual Core E2160 processor (775 Pin LGA775 package, 65 nm technology) 1,8 GHz INTEL Celeron 440 processor (775 Pin LGA775 package, 65 nm technology) 2,0 GHz
Chipset	INTEL chipset 945G/ICH7: <u>Graphic and Memory Controller Hub (GMCH) with the following functions:</u> Memory Cntrl. supports DDR2 SDRAM with 667MHz System memory bus, UMA (Unified Memory Architecture), Graphic supports 2D and 3D and video streams Plug and Display Functionality Video memory with INTEL Embedded Graphics Driver max. 224MB (Dynamic Video Memory Technology) Max. 3D Resolution: 1600 x 1200 x 32 Bit Max. Overlay Resolutoin: 2048 x 1536 x 32 Bit <u>I/O Controller Hub 7 (ICH7) with the following functions:</u> LAN 10/100 Cntrl., SATA – Cntrl., IDE-Cntrl. w/ UDMA, USB Cntrl. UHCI and EHCI, Interrupt-Cntrl., DMA-Cntrl., LPC-Interface, RTC, SMBus-Host interface

Super I/O	IT8718F: 2 Serial Ports, Keyboard Interface, PS/2 Mouse Interface, HW-Monitor
Sound controller	ALC888 Audio Codec controller with the following HDA functions: 24 Bit Stereo DAC and 20 Bit Stereo ADC Mono Mic Input (MIC) Stereo Line-Level Output
Sound connection	Mono Microphone Input, Stereo Speaker Output (2 x 1,25 W@ 8 Ohm)
Main Memory	256 MB up to max. 4GB, 2 DIMM (240pin), 1.8 V (~3 GB available) DDR2 SDRAM technology based on 256Mb, 512Mb and 1Gb technology, unbuffered non ECC, DDR2-667 Standard DIMM Height up to 35 mm
Riser-Card Interface	PCI-Bus (32 bit interface, 33MHz) PCI Express 1.0a, PCIe 1x (One slot)
BIOS	Firmware Hub: 8Mb 1024KB Flash Memory, Phoenix BIOS, PnP, PCI Rev.1.0A, DMI -support
Battery	3 V Lithium for RTC and SIO Type: Sanyo CR2032 , 220 mAh
System Bus Frequency	max. 1066MHz
RAM Bus Frequency	667MHz
PCI Bus Frequency	PCI 2.1, 33 MHz
Wake On feature	Wake On LAN, Wake On MODEM, Wake On Time
Keyboard connection	PC-AT compatible
PS/2-Mouse connection	via Y-cable together with keyboard, optional internal connection
Serial interfaces	COM1, COM2*, COM3*, COM4*
Loudspeaker	AT-compatible, volume control defined by BIOS Setup in three steps: high- , medium- , low volume compatible; foil connector
DVD connection (IDE)	Local Bus IDE interface, for 2 drives, PIO Mode 0 - Mode 4, ULTRA DMA Mode 0 – Mode 3, 2mm connector
Hard disk connection (SATA II)	2 ports , 3.0Gb/s
USB connection	general: USB1.1, USB 2.0 USB1, 2: Standard 2 port connector, series A USB3-5: not implemented USB 6-8: 1 x 6 pin header (USB8 used for USB- Hub)

Cash Drawer connection	up to 2 cash drawers can be connected, Connection via RJ12 connector at Power supply (only for one cash drawer)
PCI Plug-in card interface	32 bit interface, 33 MHz
Status display connection	Support for LEDs: Power On and HD activity
Current Consumption (G1 CPU Standard 2GB RAM	+3,3 V tbd, + 5 V tbd, + 12 V tbd
Max. Current for keyboard	+5V: 500 mA
Max. Current per port (for COM2*,3*,4*)	+12V: 600 mA
Max. Current in total (for COM2*,3*,4*)	+12V: 900 mA
Max. Current per port (for COM2*,3*,4*)	+ 5V: 300 mA
Max. Current in total (for COM2*,3*,4*)	+ 5V: 500 mA
Max. Current per port Standard USB	+ 5V: 500 mA
Max. Current in total Standard USB	+ 5V: 2,0 A
Fuses (Polyswitches): +5V +12V	 COM2*, COM3*, COM4*, USB1, USB2, Keyboard, Mouse COM2*, COM3*, COM4*
Board Dimensions	about 255mm x210mm

Plug In Cards/Risercards

The following Plug In modules have been developed in the past and are available. They may be used on the G1-CPU-DESKTOP-IMP-945G.

Secondary TFT Controller

CRT Bridge

Risercard with Standard-PCI Interfaces

Optional Risercard with PCIe 1x

New SDVO Bridge for PLink and DVI

The following Plug In modules may not be used:

LAN module (INTEL)

LAN module(REALTEK)

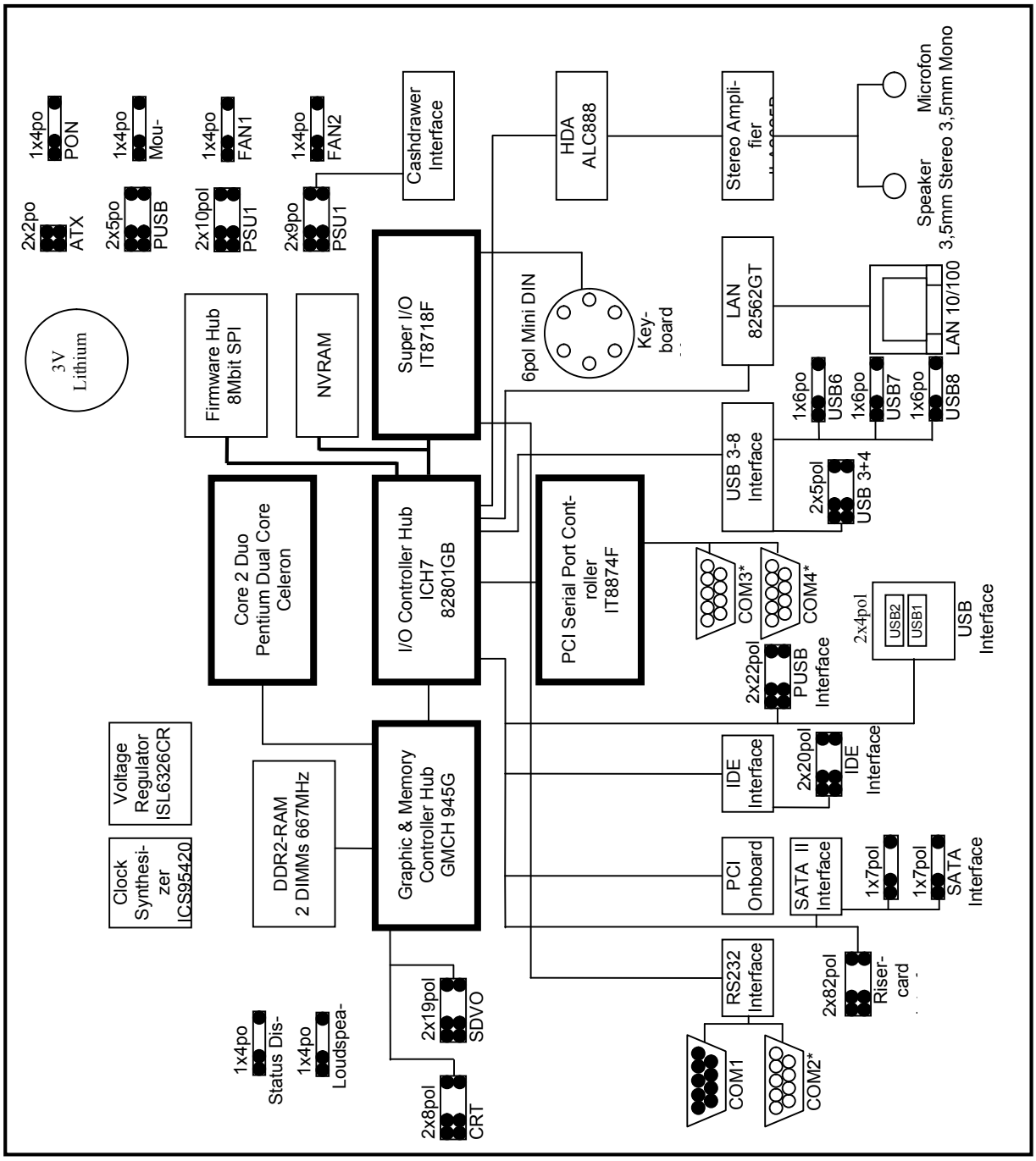
WLAN module

USBplus adapter (12V) (USB 2.0)

USBplus adapter (24V) (USB 2.0)

COM3*,COM4* adapter (PnP)

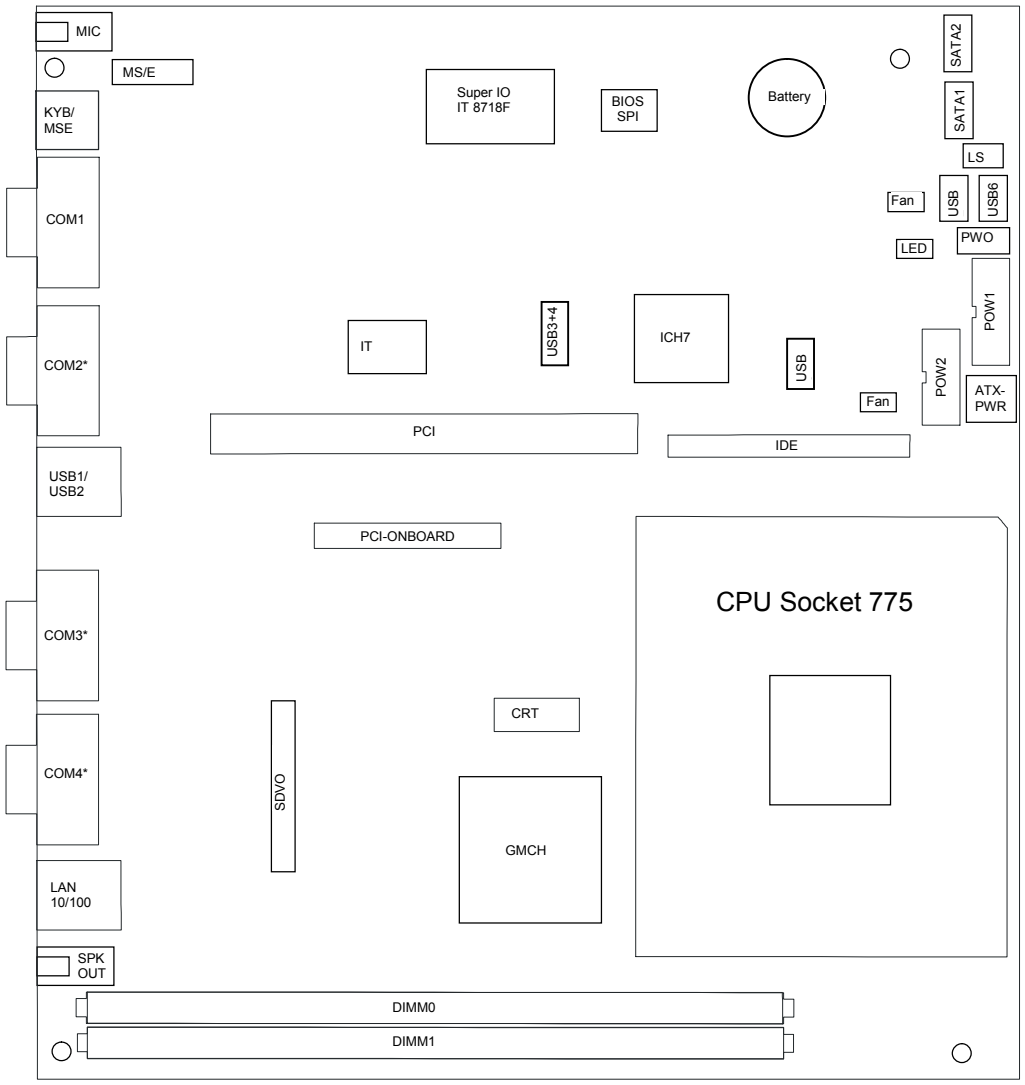
Block Diagram including Connectors



Main board G1-CPU-Desktop-IMP

Mechanical Arrangement

The CPU comprises of the printed circuit board with connectors for all external peripheral connections and for installing the optional plug in cards.



Connectors

External

Interface	Connector-Type
COM1	9 pin D-sub male
COM2*, COM3*, COM4*	9 pin D-sub female
Keyboard, Mouse	6 pin Mini Din
USB1, USB2	Standard Series Stack A
CRT (with CRT-Bridge)	15 pin HDD-sub female
TFT (with new PLINK Bridge)	40 pin Mini Delta Ribbon
LAN	8 pin RJ45 female
Line Out	3,5 mm female
Microphone	3,5 mm female

Internal

Interface	Connector-Type
DDR2-DIMMs	2 x 240 pin micro edge connector
DVD (IDE)	44 pin header, 2mm
Harddisk (SATA II)	7 pin Standard SATA header
CRT-Bridge	16 pin Header, 2.54 mm
PLINK- /DVI- Bridge	38 pin Header, 2.54 mm
USB 3,4	2 x 5 pin Header, 2.54 mm
USB 6,7,8	1 x 6 pin Header
PS/2-Mouse external	4 pin Header, 2.54 mm
Risercard	164 pin connector (PCI Express type)
PCI Onboard	80 pin board to board connector
Speaker	4 pin Dubox Header
PSU	2 x 10 pin Header 2 x 9 pin Header 2 x 5 pin Header 2 x 2 pin Header
Power On	4 pin Header
System Management Bus	4 pin Header
Status Display	4 pin Dubox Header
Fan 1,2	4 pin Header

Changing the CPU Battery

The BEETLE POS systems are equipped with a lithium battery on the CPU board (see page 10) to ensure data retention, the time and the setup parameters. The battery should be changed approximately every five years.

- ✔ When inserting the new battery, make sure the polarity is correct. This is marked in the socket. Incorrect replacement of the battery may lead to the danger of explosion.

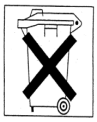
The battery is located in a socket in the CPU. To gain access to the battery, proceed as described in the according chapters of your BEETLE **User Manual.**
See:

http://www.wincor-nixdorf.com/internet/uk/Services_26Support/Support/TechnicalSupport/POSSystems/Manuals/index.html

- ✔ The lithium battery must be replaced only by identical batteries or types recommended by Wincor Nixdorf International.

You can return the used batteries to your Wincor Nixdorf International sales outlet.

Batteries containing harmful substances are marked accordingly. The chemical denotations are as follows: CD = Cadmium; Pb = Lead, Li = Lithium.



This symbol on a battery tells you that batteries containing harmful substances must not be disposed of as household waste. Follow the country specific laws and regulations. Within the European Union you are legally bound to return these batteries to the service organization where you purchased the new battery.

The setup parameters must be reset each time the battery has been changed.

BIOS Setup

The Celeron, Pentium, and Core 2 Duo main board comes with a Phoenix BIOS chip that contains the ROM Setup information of your system. This chip serves as an interface between the processor and the rest of the main boards components. This section explains the information contained in the Setup program and tells you how to modify the settings according to your system configuration.

Even if you are not prompted to use the Setup program, you might want to change the configuration of your system in the future. For example, you may want to enable the Security Password Feature or make changes to the power management settings. It will then be necessary to reconfigure your system using the BIOS Setup program so that the system can recognize these changes and record them in the CMOS RAM or the FLASH ROM. All setup data is stored in a non volatile memory (CMOS RAM). If you remove the CMOS battery, all parameters will be lost.

Standard BIOS Version

The BIOS ROM of the system holds the Setup utility. When you turn on the system, it will provide you with the opportunity to run this program. This appears during the Power-On Self Test (POST). Press <F2> to call the Setup utility. If you are a little bit late pressing the mentioned key, POST will continue with its test routines, thus preventing you from calling Setup. If you still need to call Setup, reset the system by pressing <Ctrl> + <Alt> + <Delete>. You can also restart by turning the system off and then on again. But do so only if the first method fails.

The Setup program has been designed to make it as easy as possible. It is a menu-driven program, which means you can scroll through the various sub-menus and make your selections among the predetermined choices.

When you invoke Setup, the main program screen will appear. On the following pages you will read more information about the Setup entries.
Because the BIOS software is constantly being updated, the following BIOS screens and descriptions are for reference purposes only and may not reflect your BIOS screens exactly.

BIOS Menu Bar

The top of the screen has a menu bar with the following sections:

INFO	Use this menu for information only
MAIN	Use this menu to make changes to the basic system configuration.
ADVANCED	Use this menu to enable and make changes to the advanced features.
TPM State (Note1)	Use this menu to setup an optional TPM security module.
SECURITY	Use this menu to enable a supervisor password.
POWER	Use this menu to configure and enable Power Management features.
BOOT	Use this menu to configure the default system device used to locate and load the Operating System.
EXIT	Use this menu to exit the current menu or specify how to exit the Setup program.

Note1: This entry is available only, if optional TPM security module is mounted

To access the menu bar items, press the right or left arrow key on the keyboard until the desired item is highlighted.

Legend Bar

At the bottom of the Setup screen you will notice a legend bar. The keys in the legend bar allow you to navigate through the various setup menus. The following table lists the keys found in the legend bar with their corresponding alternates and functions.

Navigation Key(s)	**Description of Functions**
<F1>	Displays the General Help screen from anywhere in the BIOS Setup.
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu.
← or → (keypad arrows)	Select the menu item to the left or right.
↑ or ↓ (keypad arrows)	Moves the highlight up or down between fields.
- (minus key)	Scrolls backward through the values for the highlighted field.
+ (plus key) or spacebar	Scrolls forward through the values for the highlighted field.
<Enter>	Brings up a selection menu for the highlighted field.
<Home> or <PgUp>	Moves the cursor to the first field.
<End> or <PgDn>	Moves the cursor to the last field.
<F9>	Loads the default configuration into Setup.
<F10>	Saves changes and exits Setup.

General Help

In addition to the Item Specific Help window, the BIOS setup program also provides a General Help screen. This screen can be called from any menu by simply pressing <F1> or the <Alt> + <H> combination. The General Help screen lists the legend keys with their corresponding alternates and functions.

Scroll Bar

When a scroll bar appears to the right of a help window, it indicates that there is more information to be displayed that will not fit in the window. Use <PgUp> and <PgDn> or the up and down keys to scroll through the entire help document.

Press <Home> to display the first page, press <End> to go to the last page. To exit the help window, press <Enter> or <Esc>.

Sub-Menu

Note that a right pointer symbol appears to the left of certain fields. This pointer indicates that a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. To call a sub-menu, simply move the highlight to the field and press <Enter>. The sub-menu then will appear immediately. Use the legend keys to enter values and move from field to field within a sub-menu just as you would do within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with each of the legend keys and their corresponding functions. Practice navigating through the various menus and sub-menus. If you accidentally make unwanted changes to any of the fields, use the set default hot key <F9>. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right side of each menu. This window displays the help text for the currently highlighted field.

Info screen

When the Setup program is accessed, the following screen appears:

Product name:	G1-CPU-IMP
Bios version:	xx/yy mm/dd/yyyy
Ethernet MAC-Address:	00-03-56-xx-yy-zz
System:	----------

Main board:	----------

Power Supply:	----------

This screen is for information only. There is nothing that could be changed within Setup.
All information is intended to facilitate the support of your system.

Product name:

This text is fixed for your main board with standard BIOS. This board is also called “G1-CPU-IMP”.

Bios version:

The Bios version is displayed in the release format xx/yy, followed by date of release in international format.

Ethernet MAC-Address:

The Ethernet MAC-Address of the Onboard LAN Controller is displayed at this line.

System, Main board, Power Supply:

The default placeholders may be replaced by specific data from factory, describing configuration, serial number etc. for each device.

Main Menu

System Time:	[08:14:46]
System Date:	[02/20/2009]
➢ IDE Primary/Master	120GB SATA1]
➢ IDE Primary/Slave	[None]
➢ IDE Secondary/Master	[None]
➢ IDE Secondary/Slave	[None]
Installed Memory:	1024 MB

System Time [XX: XX: XX]

Sets your system to the time that you specify (usually the current time). The format is hour, minute, second. Valid values for hour, minute, and second are: Hour: (00 to 23), Minute: (00 to 59), Second: (00 to 59). Use the <Tab> or <Shift> + <Tab> keys to move between the hour, minute, and second fields.

System Date [XX/XX/XXXX]

Sets your system to the date that you specify (usually the current date). The format is month, day, year. Valid values for month, day, and year are: Month: (1 to 12), Day (1 to 31), Year: (up to 2079).

Use the <Tab> or <Shift> + <Tab> keys to move between the month, day, and year fields.

Primary Master/Slave & Secondary Master/Slave

The first 2 lines are info lines about the attached S-ATA hard disks, while the next two are using for the P-ATA disks.

Note: Before attempting to configure a hard disk drive, make sure you have the configuration information supplied by the manufacturer of the drive. Incorrect settings my cause your system not to recognize the installed hard disk. To allow the BIOS to detect the drive type automatically, select [Auto].

Type:	[Auto]
LBA Format	
Total Sectors	234441648
Maximum Capacity	120GB SATA1
Multi-Sector Transfers:	[16 Sectors]
LBA Mode Control:	[Enabled]
32 Bit I/O:	[Disabled]
Transfer Mode:	[Fast PIO 4]
Ultra DMA Mode	[Mode 5]

Type [Auto]

Select [Auto] to automatically detect an IDE hard disk drive. If automatic detection is successful, the correct values will be filled in for the remaining fields on this sub-menu. If automatic detection fails, your hard disk drive may be too old or too new. You can try updating your BIOS or enter the IDE hard disk drive parameters manually.

After the IDE hard disk drive information has been entered into BIOS, new IDE hard disk drives must be partitioned (e.g. with FDISK) and then formatted before data can be read from and written to. Primary IDE hard disk drives must have its partition set to active (also possible with FDISK).

Other options for the Type field are: [None] to disable IDE devices.

Important: If your hard disk was already formatted on an older previous system, incorrect parameters may be detected. You will need to enter the correct parameters manually or use low-level format if you do not need the data stored on the hard disk. If the parameters listed differ from those used when the disk was formatted, the disk will not be readable. If the auto detected parameters do not match those that should be used for your disk you should enter the correct ones manually by setting [User].

[User]

Manually enter the number of cylinders, heads and sectors per track for your drive. Refer to your drive documentation or to the label on the drive. If no drive is installed or if you are removing a drive and not replacing it, select [None].

Cylinders

This field configures the number of cylinders. Refer to your drive documentation to determine the correct value to enter into this field.

To make changes to this field, the Type field must be set to [User].

Heads

This field configures the number of read/write heads. Refer to your drive documentation to determine the correct value to enter into this field.

To make changes to this field, the Type field must be set to [User].

Sector

This field configures the number of sectors per track. Refer to your drive documentation to determine the correct value to enter into this field.

To make changes to this field, the Type field must be set to [User].

Maximum Capacity

This field shows the drive's maximum capacity calculated automatically by the BIOS from the drive information you entered.

Multi-Sector Transfers [Maximum]

This option automatically sets the number of sectors per block to the highest number supported by the drive. This field can also be configured manually. Note that when this field is configured automatically, the value set may not always be the fastest value for the drive. Refer to the documentation that came with your hard drive to determine the optimal value and set it manually.

To make changes to this field, the Type field must be set to [User]. Configuration options: [Disabled] [2 Sectors] [4 Sectors] [8 Sectors] [16 Sectors].

LBA Mode Control [Enabled]

Select the hard disk drive type in this field. When Logical Block Addressing is enabled, 28-bit addressing of the hard drive is used without regard to cylinders, heads, or sectors. Note that Logical Block Access may decrease the access speed of the hard disk. However, LBA Mode is necessary for drives with more than 504MB of storage capacity. Configuration options: [Enabled] [Disabled].
32 Bit I/O [Disabled]

This field setting enables or disables the 32 Bit IDE data transfers. Configuration options: [Disabled] [Enabled].

Transfer Mode

This option lets you set a PIO (Programmed Input/Output) mode for the IDE device.
Modes 0 trough 4 provide successively increased performance. Configuration options:
[Standard] [Fast PIO 1] [Fast PIO 2] [Fast PIO 3] [Fast PIO 4] [FPIO 3 / DMA 1] [FPIO 4 / DMA 2].

Other options for Type are: [CD-ROM] for IDE CD-ROM drives

After using the legend keys to make your selections in this sub-menu, press the <Esc> key to exit back to the Main menu. When the Main menu appears, you will notice that the drive size is indicated in the field for the hard disk drive that you just configured.

Installed Memory: XXX MB

This field displays the amount of installed memory detected by the system during bootup. You do not need to make changes to this field. This is a display only field.

Advanced Menu

Reset Configuration Data:	[No]
Speaker Volume	[High]
Large Disk Access Mode:	[DOS]
Legacy USB Support:	[Enabled]
USB TimeOut Value:	[High]
Onboard LAN Controller:	[Enabled]
Onboard LAN BootRom:	[Enabled]
Video output to COM3:	[Disabled]
Fan Control:	[Automatic]

- Advanced Chipset Control
- I/O Device Configuration
- DMI Event Logging

Reset Configuration Data [No]

[Yes] erases all configuration data in a section of memory for ESCD (Extended System Configuration Data) which stores the configuration settings for non-PnP Plug-in devices. Configuration options: [No] [Yes]

If you are facing problems after adding or removing any hardware components to the system it might be wise to select the [Yes] option once. This allows the BIOS to reconfigure available hardware resources.

Speaker Volume [High]

This field is for the volume control of the installed speaker. Configuration options [High] [Middle] [Low].

Large Disk Access Mode [DOS]

For UNIX, Novell Netware, or other operating systems you have to select [Other].
For DOS or Windows use the value of default [DOS].
Configuration options: [DOS] [Other].

Legacy USB Support [Enabled]

This motherboard supports Universal Serial Bus (USB) devices. The default of [Disabled] the USB controller is disabled no matter whether you are using a USB device or not. The enabling of the controller will run with the help of a USB compliant operating system like Windows XP or else. If the point stands on [Enabled] the legacy USB support from the BIOS is started. Now it is possible to use a USB keyboard to start this setup or with the standard DOS environment. If you like to use a USB-Floppy disk or a USB CD-ROM device for booting, you have to enable this setup point and after detecting of this USB device from the BIOS, you have to switch the boot order to the appropriate device.
Configuration Options: [Disabled] [Enabled]

USB TimeOut Value [High]

Some USB device uses longer time to initialize. If all devices are fast enough, you can switch this setup point to Low to get a shorter boot time. Configuration Options: [High] [Low]

Onboard LAN Controller [Enabled]

This point switches physical on or off the Onboard LAN Controller. Configuration Options: [Disabled] [Enabled]

Onboard LAN Boot Rom [Enabled]

This point switches on or off the PXE PROM from the onboard LAN Controller. Configuration Options: [Disabled] [Enabled]

Video output to COM3 [Disabled]

Some systems may be configured without a full screen display, just using a small display connected to the COM3 serial port. [Enabled] will redirect diagnostic information during PowerOnSelfTest to this serial port, giving control about the system to smaller displays as well.

Fan Control [Automatic]

This setup mode will control the speed of the PWM-Fans due to actual CPU-Temperature if setting to Automatic. With Max Cooling is the speed of the fans always high. AutoSmooth will work with time hysteresis and smaller steps speeding up and down. Configuration Options:
[MAX Cooling] [Automatic] [AutoSmooth]

Advanced Chipset Control

Default Primary Video Adapter	[IGD]
IGD – Device 2:	[Auto]
IGD – Device 2, Function 1:	[Auto]
DVMT 3.0 Mode	[Auto]
Pre-Allocated Memory Size:	[8MB]
Total Graphics Memory:	[Turbo]
DVMT Graphics Memory:	216MB
Azalia Audio	[Auto]
USB 2.0 Support	[Enabled]

Default Primary Video Adapter [IGD]

Select IGD to have Internal Graphics Device, if supported and enabled, to be used as boot display device. Select PCI to have PCI Graphics to be used for the boot display.
Configuration options:[IGD] [PCI].

IGD – Device 2 [Auto]

Enables or disables the second Function of the internal graphic device
Configuration options:[Disabled] [Auto].

IGD – Device 2, Function 1 [Auto]

Configuration options:
[Disabled] [Auto].

DVMT 3.0 Mode [Auto]

The configuration of the internal graphic memory is selectable for different internal modes.
Configuration options:[Auto] [Fixed] [DVMT] [Combo].

Pre_Allocated Memory Size [8MB]

Select the amount of Pre-allocated graphic memory for use by the internal graphic device.
Configuration options:
[1MB] [8MB].

Total Graphis Memory [Turbo]

Select the amount of main memory that the internal graphic device will use during runtime.
Configuration options:[Turbo] [64MB] [128MB].

DVMT Graphics Memory xxxMB

This entry is an info field to show the maximum amount of memory the Internal Graphics Device (IGD) is using from the main memory.

Azalia Audio [Auto]

Setting item to Auto will allow the onboard audio to operate properly. Setting item to disabled will remove the onboard audio controller from PCI config space.
Configuration options:[Disabled] [Auto].

USB 2.0 Support [Enabled]

Using USB devices complying 2.0 standard, let this field be Enabled. Due to lack of appropriate drivers you may switchback to Disabled. Configuration options: [Disabled] [Enabled].

I/O Device Configuration

Serial port A:	[Enabled]
Base I/O address/IRQ:	[3F8/IRQ 4]
Serial port B:	[Enabled]
Base I/O address/IRQ:	[2F8/IRQ 3]
Touch Screen Routing:	[TFT Touch to COM2]

Serial port A [Enabled], Serial port B [Enabled]

These fields configure the Serial ports directly. Configuration options: [Disabled] [Enabled].

Base I/O address/IRQ

Set the base I/O address and interrupt line for the onboard serial connector..
Configuration options: [3F8/IRQ 4] [3E8/IRQ 4] [2F8/IRQ 3] [2E8/IRQ 3].

Touch Screen Routing [TFT Touch to COM2]

Using a Touch Screen you may select routing it to a serial interface using hardware lines instead of COM1 or COM2.
Configuration Options: [No Routing] [TFT Touch to COM1] [TFT Touch to COM2] [. PCI Touch to COM1] [PCI Touch to COM2] [TFT&PCI to COM(1&2)].

[TFT&PCI to COM(1&2)] means: TFT will be routet to COM1, PCI will be routet to COM2.

DMI Event Logging

Event log validity	Valid
Event log capacity	Space available
View DMI event log	[Enter]
Event Logging	[Enabled]
Mark DMI events as read	[Enter]
Clear all DMI event logs	[No]

Desktop Management Interface (DMI) is a method of managing computers in an enterprise. Using DMI, a system administrator can obtain the types, capabilities, operational status, installation date and other information about the system components. An event log is a fixed-length area within a non-volatile storage element.

View DMI event log [Enter]

This setup point is useful to display the recorded DMI events like a defect floppy disk controller or anything else. If there is an error stored, the BIOS will display a message every time the system is starting up.

Event logging [Enabled]

If you do not use the DMI event logging, it is possible to shut off the recording mechanism of errors.

Mark DMI events as read [Enter]

If you dislike the BIOS message at system starting up but you like to have the errors recorded, mark all DMI events as read. With the next start up of the system, the BIOS would not display a message.

Clear all DMI event logs [No]

With this point it is possible to clear all the recorded DMI events manually.

Security Menu

Supervisor Password Is:	Clear
Set Supervisor Password	[Enter]

Set Supervisor Password

This field allows you to set the password. Highlight the field and press <Enter>.

Type a password and press <Enter>, you can type up to eight alphanumeric characters. Symbols and other characters are ignored. To confirm the password, type the password again and press <Enter>. The password is now set to [Enabled]. This password allows full access to the BIOS Setup menu.

To clear the password, highlight this field and press <Enter>. The same dialog box as above will appear. Press <Enter> and the password will be set to [Disabled].

TPM State Menu

Current TPM State:	Enabled and Activated
Change TPM State	[No Change]

Current TPM State:

This is field informs about the actual state of the TPM module.

Change TPM State: [No Change]

Select the TPM changes after the next automated reboot of the system.

- [No Change]: The TPM state will be untouched.
- [Enable & Activate]: This action will switch on the TPM logical.
- [Deactivate & Disable]: This action will switch off the TPM logical. WARNING! Doing so might prevent security applications that rely on the TPM from functioning as expected.

- [Clear]: WARNING! Clearing erases information stored on the TPM. You will lose all created keys and access to data encrypted by these keys. After clearing the TPM, it will get the status deactivated & disabled.

Power Menu

The Power menu allows you to reduce power consumption. This feature turns off the video display and shuts down the hard disk after a period of inactivity.

After Power Failure:	[Stay Off]
Wake On LAN:	[Disabled]
Wake On Modem Ring:	[Disabled]
Wake On Time:	[Disabled]
➢ Hardware Monitor:	

After Power Failure [Stay off]

Select whether you want your system to be rebooted after power has been interrupted. [Stay off] leaves your system off and [Restore] reboots your system if it was active before power loss. Is the key [Follow AC/Power] selected, the system will startup anytime power is available. Configuration options: [Stay off] [Restore] [Follow AC/Power].

In mode [Follow AC/Power] the front button is disabled. This means that there is no way to force down the system pressing the front button more than 4 seconds, avoiding accidental shutdown.

Wake-on Modes

Please note that you have to shut down the system into Soft-Off or Hibernate mode before you can use Wake-on modes.

Wake-On-LAN [Disabled]

Wake-On-LAN allows your BEETLE to be powered up from Soft-Off or Hibernate mode. This may be done from another system via a network by sending a wake-up frame or signal. Configuration options: [Disabled] [Enabled].

Wake-On-Modem Ring [Disabled]

This allows to enable or disable powering up the BEETLE when the modem receives a call while the BEETLE is in Soft-Off or Hibernate mode.

NOTE: The BEETLE cannot receive or transmit data until the system and applications are fully running, thus connection cannot be made on the first try. Turning an external modem off and then back on while the BEETLE is off causes an initialization string that will cause the system to power on. Configuration options: [Disabled] [Enabled].

Wake-On-Time [Disabled]

This allows an unattended or automatic system power up from Soft-Off or Hibernate mode. You may configure your system to power up at a certain time. The wake-up time is to be set in the next field below this field. Configuration options: [Disabled] [Enabled]

Hardware Monitor

CPU Temperature:	42 ˚C
Board Temperature:	35 ˚C
Fan_1	4448 rpm
Fan_2	5480 rpm
Fan_PowerSupply	2790 rpm
Core Voltage	1.26 V
+1.8V Voltage	1.82 V
+3.3V Voltage	3.39 V
+VCC Voltage	5.26 V
+12V Voltage	12.48 V
-12V Voltage	12.03 V
+1.5V Voltage	1.48 V
+5VSB Voltage	5.18 V
VBatt Voltage	3.0 V

CPU Temperature [xx °C]

The onboard hardware monitor is able to detect the motherboard and CPU temperatures (for supported processors only).

CPU Fan_x Speed [xxxx rpm]

The onboard hardware monitor is able to detect the CPU fan speed and power supply fan speed in rotations per minute (rpm). The presence of the fans is automatically detected.

Several Voltages [xx.x V]

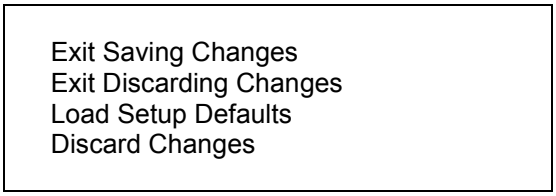
The onboard hardware monitor is able to detect the voltage output by the onboard voltage regulators.

Boot Menu

Boot	priority order:
1:	USB FDC:
2:	USB CDROM :
3:	IDE CD :
4:	USB HDD :
5:	IDE 0 :
6:	IDE 1 :
7:	IDE 2 :
8:	PCI LAN :
Excluded	from boot order
:	IDE 3 :
:	USB Key :
:	USB ZIP :
:	PCI SCSI
:	PCI :
:	Legacy Network Card:
:	UNKNOWN:

The Boot menu allows you to select from the four possible types of boot devices listed using the up and down arrow keys. By using the <+> or <Space> key, you can promote devices and by using the <-> key, you can demote devices. Promotion or demotion of devices alters the priority which the system uses to search for a boot device on system power up.

Exit Menu



Once you have made all your selections from the various menus in the Setup program, you should save your changes and exit Setup. Select Exit from the menu bar to display the following menu.

<Esc> does not exit this menu. You must select one of the options from this menu or <F10> from the legend bar to exit this menu.

Exit Saving Changes

Once you have finished making selections, choose this option from the Exit menu to ensure the values you selected are saved to the CMOS RAM. The CMOS RAM is sustained by an onboard backup battery and stays on even when the BEETLE is turned off. Once this option is selected, a confirmation is asked. Select [Yes] to save changes and exit.

Exit Discarding Changes

This option should only be used if you do not want to save the changes you have made to the Setup program. If you have made changes to fields other than

system date, system time, and password, the system will ask for confirmation before exiting.

Load Setup Defaults

This option allows you to load the default values for each of the parameters on the Setup menu. When this option is selected or if <F9> is pressed, a confirmation is requested. Select [Yes] to load default values. You can now select Exit Saving Changes or make other changes before saving the values to the non-volatile RAM.

Discard Changes

This option allows you to discard the selections you made and restore the values you previously saved. After selecting this option, a confirmation is requested. Select [Yes] to discard an changes and load the previously saved values.

Test points codes

At the beginning of each POST routine, the BIOS outputs the test point error code to I/O port address 80h. Use this code during trouble shooting to establish where the system failed and what routine has been performed.

If the BIOS detects a terminal error condition, it halts POST after issuing a terminal error beep code and attempting to display the error code on the port 80h LED display (diagnostic card). If the system hangs before the BIOS can process the error, the value displayed at the port 80h is the last test performed. In this case, the screen does not display the error code.

The routine derives the beep code from the test point error as follows:

1. The 8-bit error code is broken down to four 2-bit groups.

2. Each group is made one-based (1 through 4) by adding 1.

3. Short beeps are generated for the number in each group.

Example:

Test point 1Ah = 00 01 10 10 = 1-2-3-3 beeps

The following is a list of the checkpoint codes written out to the diagnostic port at the start of each test.

The first beep code inside of the BIOS has 1-long and 2-short beeps. This means that there is a problem with the graphic adapter.

POST Code (Hex)	Name	Description

02h	VERIFY_REAL	IF <in port mode> THEN
		Turn on A20
		Reset Processor
		ENDIF

03h	DISABLE_NMI	Disable non-maskable Interrupts

04h	GET_CPU_TYPE	IF <cold boot> THEN
		Store reset DX value in CMOS
		Determine CPU manufacturer and type
		Store CPU manufacturer and type in CMOS
		ENDIF

06h	HW_INIT	Reset all DMA controllers. Disable all video controllers. Clear any pending interrupts from the RTC Set up port 61h to speaker off and timer gate enabled.
08h	CS_INIT	Set DRAM controller registers to values that are needed for DRAM discovery and testing.
09h	SET_IN_POST	Set bit in CMOS indicating that POST is in progress. Not cleared until Post Code Aeh.
0Ah	CPU_INIT	Set CPU configuration registers.
0Bh	CPU_CACHE_ON	Turns on the CPU cache.
0Ch	CACHE_INIT	Set L2 cache controller registers to values needed for SRAM discovery and testing.

0Eh	IO_INIT	IF <onboard super I/O exists> THEN
		Turn Off LPT and COM ports in super I/O.
		Set I/O controller registers to default values.
		ENDIF

0Fh	FDISK_INIT	IF <secondary IDE controllers exists> THEN
		Set secondary IDE controller configura-
		tion registers to default values.
		ENDIF

10h	PM_INIT	IF <power management enabled> THEN
		Set the power management configuration registers
		to default values.
		ENDIF

11h	REG_INIT	Set Cx5520 configuration registers to default values. Set any other configuration registers to default values.
12h	RESTORE_CR0	Return to real mode.
13h	PCI_BM_RESET	Early reset of PCI devices required to disable bus masters. Assumes the presence of a stack and running from decompressed shadow memory.
14h	8742_INIT	Verify 8742 (keyboard controller) is responding. Improper connections/timing to the 8742. Send self test command to 8742.

POST Code (Hex)	Name	Description

16h	CHECKSUM	Checksum the system BIOS ROM
		IF <checksum is incorrect> THEN
		Halt.
		ENDIF

17h	PRE_SIZE_RAM	Initialize external cache before autosizing memory.
18h	TIMER_INIT	Initialize all three of the 8254 timers.
1Ah	DMA_INIT	Initialize the DMA command register and all 8 DMA channels.
1Ch	RESET_PIC	Initialize the 8259 interrupt controller.

20h	REFRESH	Copy test code to RAM and execute that code looking for refresh bit in port 61h to toggle.
		IF <refresh test failed> THEN
		Halt.
		ENDIF

22h	8742_TEST	Read 8742 self-test results.
		IF <self-test failed> THEN
		Halt.
		ELSE
		Read system info from 8742
		Set 8742 command byte.
		ENDIF

24h	SET_HUGE_ES	Go into protected mode. Set ES, DS, SS, FS, and GS to 4Gb.
28h	SIZE_RAM	Determine the size of each DRAM bank. Set DRAM controller configuration registers to enable DRAM.
29h	MEM_MGR_INIT	Initialize the POST Memory manager.
2Ah	ZERO_BASE_RAM	Clear the 512k of DRAM.

2Ch	ADDR_TEST	Test for stuck address line in lower 1M of address space,
		IF <test failed> THEN
		Halt.
		ENDIF

2Eh	BASERAML	Test for stuck DRAM data line by walking a 1 through all bit locations of address 0 and then walking a 0 through.
		IF <test failed> THEN
		Halt.
		ENDIF

2Fh	PRE_SYS_SHADOW	Clears the cache before shadowing the system.
32h	COMPUTE_SPEED	Determine the CPU core speed by timing the execution of a loop.
33h	PDM_INIT	Initialize the Phoenix Dispatch Manager.

34h	CMOS_TEST	Clear CMOS diagnostic byte.
		IF <CMOS battery is dead> THEN
		Set “bad battery” flag in CMOS
		IF <CMOS checksum is bad> THEN
		Set “bad CMOS check” flag in CMOS
		Checksum CMOS
		ENDIF
		ENDIF

36h	CHK_SHUTDOWN	Vector to proper shutdown routine (reset).
38h	SYS_SHADOW	Copy system BIOS ROM to shadow RAM.
3Ah	CACHE_AUTO	Detect the amount of SRAM for the L2 cache. Set L2 cache controller configuration registers to enable SRAM.

POST Code (Hex)	Name	Description

3Ch	ADV_CS_CONFIG	IF <CMOS is valid (checksum good and battery good) THEN
		Load DRAM controller configuration registers with values from CMOS fields.
		ENDIF

3Dh	ADV_REG_CONFIG	IF <CMOS is valid> THEN
		Load ISA controller configuration registers with values from CMOS fields and load any other configuration registers with values from CMOS fields.
		ENDIF

42h	VECTOR_INIT	Set interrupt vectors 0-77h to BIOS general interrupt handler.
44h	SET_BIOS_INT	Set interrupt vectors 0-20h to correct BIOS interrupt handlers.
45h	CORE_DEVICE_INIT	Initialize all motherboard devices.
46h	COPYRIGHT	Verify that the Phoenix BIOS copyright message is correct.
47h	PCI_OP_INIT	Initialize PCI option ROM manager.
48h	CONFIG	Determine video type to be used and store.
49h	PCI_INIT	Initialize PCI to PCI bridges. Reset all PCI devices. Send self test command to all PCI devices. Configure base registers of all PCI devices.
4Ah	VIDEO	Initialize all MDA video adapters. Initialize all CGA video adapters. Execute VGA option ROMs to initialize VGA adapter. Initialize VSA.
4Bh	QUIETBOOT_START	Initialize Quietboot if installed. Enable IRQ0 and IRQ1.

4Ch	VID_SHADOW	IF <video shadow enabled in setup> THEN
		IF <CMOS valid and last boot successful> THEN
		Shadow video BIOS ROM.
		ENDIF
		ENDIF

4Eh	CR_DISPLAY	Display the CPU type and speed on the screen.

51h	EISA_INIT	IF <EISA support is enabled> THEN
		Checksum EISA data NVRAM locations.
		IF <checksum good> THEN
		Initialize each slot.
		ELSE
		Display bad config message.
		ENDIF
		ENDIF

52h	KB_TEST	Check for return code of AA from keyboard self-test,
		IF <return code not AA> THEN
		Set keyboard error flag
		ENDIF

54h	KEY_CLICK	IF <keyclick enabled and keyboard good> THEN
		Initialize key stroke clicker
		ENDIF

56h	ENABLE_KB	Send command to keyboard controller to enable the keyboard.
58h	HOT_INT	Check for unexpected interrupts. Check for unexpected NMI. Enable parity checkers and check for unexpected NMI.
59h	PDS_INIT	Register POST display services with POST Dispatch Manager.

POST Code (Hex)	Name	Description
5Bh	CPU_CACHE_OFF	Disable and WB invalidate CPU cache.
5Ch	MEMORY_TEST	Determine amount of memory below 1M. Walk a1 through data bus at 80000h. walk a 0 through data bus at 80000h. Check for stuck address line from 80000h to 8FFFFh.
60h	EXT_MEMORY	Determine total amount of memory by doing a read/write test. For each 1M block oh memory: Walk a 1 through data bus at first location of block. Walk a 0 through data bus at first location of block. Check for stuck address line in the block.
62h	EXT_ADDR	Do an extended address line test on the entire memory range.
64h	USERPATCH	Code that is patched into the ROM can be set up to execute at this point.
66h	CACHE_ADVNCD	Load L2 cache controller configuration registers with values from setup screens.
68h	CACHE_CONFIG	Set non-cacheable regions. Enable L1 and L2 caches.

6AH	DISP_CACHE	IF <cache RAM size not zero> THEN
		Display L2 cache RAM size on screen.
		ENDIF

6Ch	DISP_SHADOW	IF <system BIOS ROM shadowed> THEN
		Display message indicating that the system BIOS ROM is shadowed.
		ENDIF
		IF <video BIOS ROM shadowed> THEN
		Display message indicating that the video BIOS ROM is shadowed.
		ENDIF

6Eh	DISP_NONDISP	Display the starting address of the no disposable (run time) BIOS.
70h	ERROR_MSGS	Display error messages for any errors found.

72h	TEST_CONFIG	IF <system configuration error found> THEN
		Display message indicating configuration error detected.
		ENDIF

74h	RTC_TEST	Verify that the RTC is running.
		IF <RTC not running> THEN
		Set bit in RTC indicating that the time is invalid.
		ENDIF

76h	KEYBOARD	IF <keyboard failure detected> THEN
		Display message indicating keyboard failure.
		ENDIF

7Ch	HW_INTS	Initialize hardware interrupt vectors 08h-0Fh
7Dh	ISM_INIT	Initialize Intelligent System Monitoring Support.
80h	IO_BEFORE	IF <integrated super I/O exists> THEN Disable LPT and COM ports on integrated super I/O. ENDIF.
81h	CORE_LATE_INIT	Late initialization of devices.
82h	RS232	Identify and test all COM ports.
83h	CONFIG_IDE	Configure Fdisk controller.
84h	LPT	Test and ID parallel ports.
85h	PCI_PCC	Initialize PnP ISA devices.

POST Code (Hex)	Name	Description
87h	POST_CONFIG_MCD	Initialize Mother Board Configurable devices.
88h	BIOS_INIT	Initialize timeouts, key buffer, soft reset flag.
89h	ENABLE_NMI	Enable NMI.
8Ah	INIT_EXT_BDA	Initialize the extended BIOS data area.

8Bh	MOUSE	IF <mouse support enabled> THEN
		Setup interrupt vector for mouse.
		Add mouse support to equipment installed flag.
		ENDIF

8Ch	FLOPPY	Test both floppy drives.
		IF <error detected> THEN
		Display floppy error message.
		ENDIF

8Fh	FDISK_FAST_PREINIT	Count and store the number of ATA drives in the sub-system.

90h	FDISK	Initialize the hard disk subsystem and test.
		IF <error detected> THEN
		Display hard disk error message.
		ENDIF

91h	FDISK_FAST_INIT	Set timing based on drives attached.
92h	USERPATCH2	Code that is patched into the ROM can be setup to execute at this point.
93h	MP_INIT	Create the CPU feature table.
94h	DISABLE_A20	Disable the A20 address line.
95h	CD	Validate bootable CD ROM. Prepare CD for CD ROM boot.
96h	CLEAR_HUGE_ES	Store an 8 in the shutdown code byte in CMOS. Reset the processor.
97h	MP_FIXUP	Create pointer to MP table in Extended BDA.
98h	ROM_SCAN	Scan through the ISA option ROM space and jump to each option ROM found. Shadow PCI option ROMs and initialize cards.
9Ah	MISC_SHADOW	Shadow expansion ROM areas that are enabled from setup.
9Ch	PM_SETUP	Setup power management if enabled.
9Dh	SECURITY	Initialize Security Engine.
9Eh	IRQS	Enable IRQ 0, 1, 2, and 6.
9Fh	FDISK_FAST_INIT2	Check and store the total number of Fast Disks (ATA and SCSI).
A0h	TIME_OF_DAY	Verify that the system clock interrupts are occuring.

A2h	KEYBOARD_TEST	Set NumLock indicator.
		IF <keylock set> THEN
		Print error message on screen.
		ENDIF

POST Code (Hex)	Name	Description
A4h	KEY_RATE	Initialize keyboard typematic rate.

AAh	SCAN_FOR_F2	IF <2 key was pressed during POST> THEN
		Set flag indicating key press.
		Display “Entering Setup” message.
		ENDIF

ACh	SETUP_CHECK	IF <2 was pressed> THEN
		Enter Setup.
		ELSE IF <errors were found> THEN
		Display “Press 7 or 2” prompt.
		IF <2 is pressed> THEN
		Enter Setup.
		ELSE IF <7 is pressed> THEN
		Boot.
		ENDIF
		ELSE
		Boot.
		ENDIF

AEh	CLEAR_BOOT	Clear CMOS bit indicating POST is in progress.

B0h	ERROR_CHECK	IF <error were found> THEN
		Beep twice.
		Display “Press 7 or 2” message.
		IF <2 is pressed> THEN
		Enter Setup.
		ELSE IF <7 is pressed> THEN
		Boot.
		ENDIF
		ENDIF

B2h	POST_DONE	Change BIOS data areas flag to indicate POST is complete.
B4h	ONE_BEEP	Beep once.
B5h	QUIETBOOT_END	Reset video: Clear screen, reset cursor, reload DAC.

B6h	PASSWORD	IF <password enabled> THEN
		Print message requesting password.
		IF <password incorrect> THEN
		Halt.
		ENDIF
		ENDIF

B8h	SYSTEM_INIT	Clear the GDT.
B9h	PREPARE_BOOT	Prepare to boot, clear the screen.
BAh	DMI	Initialize DMI header and substructures.
C0h	INT19	Do INT 19h to load OS.

Additional Test points codes

These test points are only available if the memory has some malfunction.

POST Code [Hex]	Description
E0h	Unsupported RAM detected / No RAM installed
E1h – EFh	RAM specification not valid

Abbreviations

ACPI	**Advanced Configuration and Power Interface**
AGTL+	Assisted Gunning Transceiver Logic
APC	Advanced Power Control
PM	Advanced Power Management
AT	Advanced Technology
ATA	AT Attachment
BGA	Ball Grid Array
BIOS	Basic Input and Output System
CMOS	Complementary Metal Oxide Semiconductor
CPLD	Complex Programmable Logic Device
CPU	Central Processing Unit
CRT	Cathode-ray Tube
DIMM	Dual Inline Memory Module
DMA	Direct Memory Access
DMI	Desktop Management Interface
DVMT	Dynamic Video Memory Technology
DVI	Digital Video Interface
ECP	Extended Capabilities Port
EEPROM	Electrical Erasable Read Only Memory
E-IDE	Enhanced Integrated Drive Electronics
EMS	Expanded Memory System
ESCD	Extended System Configuration Data
EPP	Enhanced Parallel Port
FSB	Front Side Bus
GTL	Gunning Transceiver Logic
HW	HardWare
IDE	Integrated Drive Electronics
IGD	Internal Graphic Device
LAN	Local Area Network
LBA	Logical Block Addressing
LCD	Liquid Crystal Display
MAC	Media Access Control
NA	Power failure
NVRAM	Non-volatile Random Access Memory
P-ATA	Parallel AT Attachment (old version of hard disk interface)
POS	Point of Sales
PCI	Peripheral Component Interconnect
PnP	Plug and Play
POST	Power On Self Test
RAM	Random Accessible Memory
RI	Ring Indicator
ROM	Read Only Memory
RS	Retail Systems
SATA	Serial AT Attachment (new version of hard disk interface)
SLP	System Locked Pre-Installation
SMI	System Management Interrupt
SMM	System Management Mode
SMRAM	System Management RAM
SPGA	Staggered Pin Grid Array
TFT	Thin-film transistor
TPM	Trusted Platform Module
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
UUID	Universal Unique IDentifier
VGA	Video Graphics Array
WOL	Wake On LAN
WOM	Wake On Modem

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